Teaching NeuroImage: Pontine Owl-Eyes Lesions in a Case of Neuroborreliosis

Author(s):
Simon Borgeaud, MD\textsuperscript{1}; Maria Isabel Vargas, MD\textsuperscript{2}; Patrice H Lalive, MD\textsuperscript{1,3}

Corresponding Author:
Simon Borgeaud
simon.borgeaud@hcuge.ch

Copyright © 2021 American Academy of Neurology. Unauthorized reproduction of this article is prohibited

Neurology® Published Ahead of Print articles have been peer reviewed and accepted for publication. This manuscript will be published in its final form after copyediting, page composition, and review of proofs. Errors that could affect the content may be corrected during these processes.
Affiliation Information for All Authors: 1. Department of Neurosciences, Division of Neurology, Geneva University Hospital and University of Geneva, Geneva, Switzerland; 2. Division of Neuroradiology, Geneva University Hospital and University of Geneva, Geneva, Switzerland; 3. Diagnostic Department, Division of Laboratory Medicine, Geneva University Hospital, Geneva, Switzerland

Contributions:
Simon Borgeaud: Drafting/revision of the manuscript for content, including medical writing for content; Major role in the acquisition of data; Study concept or design; Analysis or interpretation of data
Maria Isabel Vargas: Analysis or interpretation of data
Patrice H Lalive: Drafting/revision of the manuscript for content, including medical writing for content; Study concept or design; Analysis or interpretation of data

Number of characters in title: 54

Abstract Word count:

Word count of main text: 100

References: 2

Figures: 1

Tables: 0

Neuroimage Legend Count: 47

Supplemental: patient consent-to-disclosure, reporting guidelines (CASE), teaching Slides, manuscript tracked changes - v2

Search Terms: [ 120 ] MRI, [ 139 ] Bacterial infections

Study Funding: The authors report no targeted funding

Disclosures: The authors report no disclosures relevant to the manuscript.
Brain MRI in a 65-year-old woman with headache, sensory ataxia and tick exposure revealed leptomeningeal and cranial nerve enhancement and T2-hyperintense symmetrical pontine lesions resembling the “owl-eyes” sign, a radiological finding described in ischemic or compressive myelopathy (Figure A-C). CSF analysis revealed pleocytosis (163/µL) and intrathecal production of anti-\textit{Borrelia} IgG (CSF/serum index 21, N<2). Work-up was negative for alternative causes. The patient fully recovered after 21 days of ceftriaxone (Figure D-F).

Radiological findings in neuroborreliosis include signs of cranial neuritis, meningitis or stroke. In patients presenting with symmetrical T2-hyperintense lesions of the pons, this case supports the inclusion of neuroborreliosis in the differential diagnosis.
### Appendix 1: Authors

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simon Borgeaud, MD</td>
<td>Department of Neurosciences, Division of Neurology, Geneva University Hospital, Geneva and Faculty of Medicine, Switzerland.</td>
<td>Acquired the data (examined the patient, made the diagnosis), composed the figure and wrote the manuscript.</td>
</tr>
<tr>
<td>Maria Isabel Vargas, MD</td>
<td>Division of Neuroradiology, Geneva University Hospitals and University of Geneva, Geneva, Switzerland;</td>
<td>Reviewed radiological images, designed and composed the figure.</td>
</tr>
<tr>
<td>Patrice H. Lalive, MD</td>
<td>Department of Neurosciences, Division of Neurology, Geneva University Hospital, Geneva and Faculty of Medicine, Switzerland. AND Diagnostic Department, Division of Laboratory Medicine, Geneva University Hospital, Geneva, Switzerland</td>
<td>Acquired the data (examined the patient, made the diagnosis) and revised the manuscript.</td>
</tr>
</tbody>
</table>
References


**Figure: Pontine owl-eyes lesions** - MRI before (A-C) and 1 week after (D-F) antibiotic treatment: axial T2 (A, D), coronal FLAIR with gadolinium (B, E), axial T1 with gadolinium (C, F). Initial MRI reveals symmetrical ovoid T2-hyperintense, T1-hypointense pontine lesions, with local (C), leptomeningeal (B) and cranial nerves (not shown) contrast enhancement. Post-treatment MRI shows absence of contrast enhancement in the lesions.
Teaching NeuroImage: Pontine Owl-Eyes Lesions in a Case of Neuroborreliosis
Simon Borgeaud, Maria Isabel Vargas and Patrice H Lalive
Neurology published online October 21, 2021
DOI 10.1212/WNL.0000000000013009

This information is current as of October 21, 2021